

New research

Developing plant proteins

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The rise of veganism and the flexitarian diet has encouraged industry to produce (or reformulate) products that cater for this growing band of consumers. Plant-based proteins are consequently in demand as the industry looks for alternatives to animal-based ingredients. The challenge is the sourcing and extraction of suitable proteins that can compete with the current animal-based ingredients (e.g. egg and dairy) that many manufacturers depend on.

This member-funded project is developing techniques to produce protein-rich ingredients from plants in a cost- and time-efficient manner. The aim is to optimise the nutritional value and technical performance of these ingredients. This year our research has focused on developing proteins from chickpeas and microalgae including the processes to maximise their yield and functionality.

Earlier this year, as part of the project, we undertook a consumer survey which has since been used to steer the project. It established consumers':

- willingness to consume a variety of plant-based protein-rich ingredients
- acceptance of these ingredients across different product categories, and
- drivers and barriers to plant-based food consumption. ■

Results are available upon request. Turn to page 3 to find out more about the plant-based alternatives we've found





Challenges of incorporating inulin and fructans

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Inulin and fructo-oligosaccharides (FOS) have attracted a great deal of interest as functional dietary fibres. With their mild sweetness but lack of distinct flavour, inulin and FOS can be used to replace sugar or enhance fibre in certain products. As manufacturers seek to reduce calories in their products, incorporating these ingredients (to reduce calorie density) may be a way of achieving this.

However, inulin and FOS are not for everybody. As 'FODMAPs'*, they can cause digestive discomfort, when consumed above certain levels in the diet, in susceptible individuals. It's therefore important for manufacturers and retailers to inform consumers of the levels of these ingredients in their products - this requires analysis.

Testing for fibre is tricky as the available methods provide slightly different results depending on the fibres present in the product. We have recently developed and validated an improved method for the measurement of inulin and related fructans in a wide range of products including chocolate, wholegrain breakfast drinks, smoothies and protein bars.

We are the only laboratory that conducts this analysis in the UK, so the method is an important part of our analytical support to members and other clients. It is also an important aspect of our project on calorie reduction through fibre enhancement, which is exploring the value of inulin for this purpose. ■

* Fermentable oligo-, di-, mono-saccharides and polyols

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For other sites, see
www.campdenbri.co.uk/campdenbri/contact.php

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New members

We are delighted to welcome the following new members:

- B9 Beverages PVT Ltd - brewers
 - Brewers of Europe - brewing association
 - Bridge Farm Group Ltd - growers of ornamental plants and culinary herbs
 - Doisy and Dam - manufacturer of chocolate
 - Flower & White Ltd - manufacturer of meringue and chocolate bars
 - Gafoor Pure Halal Ltd - halal chicken processors
 - Mars Chocolate Drinks & Treats - food manufacturers
 - O'Haras of Foxford Ltd - manufacturer of bread and cakes
 - Proactive Analytics - developers of a defect detection device
 - Rhokett Ltd - manufacturer of desserts
 - Urban Evolution LLC - beer development
 - Vale of Glamorgan Council - local authority
 - Willett Food Projects Ltd - food factory design and project management
 - Whitby Sea Salt Ltd - manufacturer of sea salt
- Clare Brett +44(0)1386 842125 membership@campdenbri.co.uk

Please notify the Membership Department of any changes to your company's name or address to allow us to keep our records up to date.

News

RSPH Hygeia award for HACCP

www.campdenbri.co.uk/training/haccp-advanced

Congratulations to Environmental Health Officer Marguerite Morris who won the 2019 Royal Society for Public Health (RSPH) Hygeia award for HACCP. After attending our HACCP Level 4 course, Marguerite sat the exam and achieved the highest score this year for the qualification. ■



Experts on video Investigating plant-based proteins

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The food industry is responding to consumer demand for plant-based alternatives to animal proteins. However, most individual plant proteins do not provide the same range of essential amino acids. Manufacturers are also confused about which plant-based proteins are available to them and how they function during new product development.

In a recent video, ingredients research team leader Tiiia Morsky covers her research into achieving the greatest yield and optimal functionality from new plant-based ingredients. You'll also find out what the project has accomplished so far, what will be investigated next and how the sector will benefit from the outcomes of this member-funded research. ■

To watch the video, search 'plant proteins' at campdenbri.co.uk



Campden BRI attends - Food ingredients Europe conference

3-5 December • Paris, France

Campden BRI will be presenting and exhibiting at the Food ingredients Europe conference next month.

Our ingredients research team leader, Tiiia Morsky, will deliver a presentation covering the clean label plant-based ingredients that can be used in baked products (e.g. as alternatives to egg) and the benefits for industry. Bertrand Emond will talk on the potential threats of food fraud and cover successful industry-led initiatives that countered supply chain threats.

Our team will be at stand 6F165. If you attend, be sure to pop by and say hello - they love discussing hot topics in the food and drink industry! ■

www.figlobal.com/fieurope/



Need help with powders?

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Our production and processing team has recently acquired new equipment that will increase our clients' understanding of the flow behaviour of their powders.

Many manufacturers who process powders can experience occasional blockages in their systems. This may result in equipment shutdown costing a business valuable time and money. Analysing samples on our new powder flow analyser and tap density meter will dramatically reduce the likelihood of blockages while improving process efficiency. ■

Get in touch to find out more about how this new equipment can help you

Repurposing food waste to make a high fibre claim

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On average, people in the UK do not eat enough fibre. A report produced by the Scientific Advisory Committee on Nutrition in 2015 suggested the average adult should consume 30g of dietary fibre a day. Consumers who do not achieve this expose themselves to an increased risk of obesity, type 2 diabetes and colorectal cancers.

Consumers are becoming aware of these risks and this has increased the demand for high fibre products. Consequently, food and drink manufacturers are now under pressure to reformulate their products with more fibre so that they qualify for fibre claims. But what approaches can they take to achieve this?

Increasing fibre

Two common methods manufacturers use to enhance the fibre in their products include incorporating:

- pure fibres, e.g. inulin, or
- whole ingredients naturally high in fibre, e.g. seeds or nuts

Alternatively, manufacturers can tap into food waste streams to incorporate highly fibrous foods into their products - with the added benefit of repurposing food and reducing waste. Our member-funded project 'Calorie reduction and fibre enhancement' is focused on this.

Food waste for high fibre

Our bakery scientists redeveloped a traditional tortilla by replacing 20% of the ordinary flour with butternut squash skin powder, increasing the tortilla's fibre by 97% (from 3.3g to 6.5g per 100g).

Our team created this powder by grinding up peels supplied by Campden BRI member, Barfoots of Botley Ltd, to support the project. The peels would otherwise go to waste when manufacturers process butternut squash, for example, with soup.



The benefits of this approach

Consumers like familiarity, as was made apparent at our recent Sensory and Consumer MIG meeting. A guest speaker from Mindlab presented findings from a large-scale consumer survey which showed that consumers favour products that are familiar, as opposed to novel. So, increasing the fibre of an existing product that's well known to consumers (as we did with the tortillas) holds potential as an effective route to increasing the public's fibre intake.

Also, if it was on the market, the reformulated tortilla could declare a 'high fibre' claim (see right) making it more appealing to consumers.

Repurposing food waste

'Getting more from less' has been a major 'need' articulated by our members which was again repeated at recent MIG meetings where members expressed their desire to reduce food waste. This recent work has shown an effective way of repurposing waste in a product without impacting heavily on its functionality (see August newsletter for more).

Functionality challenges

Wheat flour has many favourable qualities. For example, it forms gluten relatively quickly. Unsurprisingly, replacing the tortilla's wheat flour with the butternut squash skin powder affected the tortilla's functionality. As our powder increased gluten formation time, longer mixing times would need to be factored in when taking on a similar approach. In a previous experiment where we used butternut squash skin powder to make a naan bread, we also found that as more powder was incorporated, the naan lost volume and became hard. However, as the ratio of water is higher when using the powder instead of wheat flour, there is potential for higher yields at lower cost.

What's next?

We are currently trialling different types of commercial fibres at varying concentrations in a pizza base, tomato sauce and in meatballs, while assessing any characteristics that may affect product quality or consumer acceptability. ■

We would love to get your ideas on which product types you would like us to use in our upcoming consumer/sensory trials. Get in touch or attend the Nutrition and Health MIG meeting early next year to provide feedback.



Nutrition and health claims

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Nutrition claims (e.g. "low fat", "high fibre") and health claims (e.g. "Vitamin D is needed for normal growth and development of bone in children") are often used to highlight the beneficial effects of products, making them more attractive to consumers. These claims are presented on the product label or in its advertising but are regulated in the EU by legislation, namely Regulation (EC) No 1924/2006 on Nutrition and Health Claims. This ensures any claims made are clear, accurate and based on scientific evidence.

We often receive enquiries from clients about how to achieve a fibre claim. The conditions to make such claims are laid down in the Annex to Regulation (EC) No 1924/2006 which provides the following:

- **Source of fibre**

A claim that a food is a source of fibre, and any claim likely to have the same meaning for the consumer, may only be made where the product contains at least 3g of fibre per 100g or at least 1.5g of fibre per 100 kcal.

- **High fibre**

A claim that a food is high in fibre, and any claim likely to have the same meaning for the consumer, may only be made where the product contains at least 6g of fibre per 100g or at least 3g of fibre per 100 kcal.

This legislation will continue to apply once the UK has left the EU. Products exported to the EU after EU exit day will be required to comply with Regulation (EC) No. 1924/2006. For products sold in the UK, it is yet to be determined whether this law will be retained as it is or whether a new law will be put in place in due course. ■

Member zone

to access privileged member information and services

Project update

Pre-processing to improve nutrition

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This year we began a new project to help our members optimise the nutritional value and functionality of the ingredients in their food products. It will also investigate the effect of processing techniques on the bioavailability of nutrients. So far, we have investigated the effect of two processes on whole wheat:

Sprouted whole wheat - used in cake without negatively affecting volume, fluffiness, softness and other key cake properties.

Extruded whole wheat flour - found to have potential use in cake batter to increase viscosity, stability and fibre levels.

We're continuing research into using these two ingredients for sugar reduction applications. Next, we will look at the biofortification of wheat in bread. Results will be reported at the end of this year and the research will continue for another two years.

New pre-processing literature review

As part of this project, we've recently published a literature review to summarise the research in this area. It identifies the various physical and chemical pre-processing techniques that are commonly used in the industry. Search 'R&D457' at campdenbri.co.uk to find out what effect each pre-processing method has on nutrition and techno-functionality. ■



Keeping up to date

Members have exclusive access to password controlled areas of our website for accessing project web pages, latest research programme, R&D reports and research summaries

www.campdenbri.co.uk/research.php

Project update

Ingredient selection to meet nutritional targets

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A member-funded research project has been developing a tool which will help our members select ingredients when formulating products to achieve compositional and nutritional targets. Case studies, for example the reduction of sugar and fat in cheesecake and ice cream, were initially used to investigate methods that address a range of nutritional drivers, allowing us to start work on the development of a database.

Earlier this year, the database tool was further enhanced by feedback from our members who received a demonstration of the updated prototype at the autumn Nutrition and Health MIG meeting. Final adjustments are now being made before the information is released to members. ■

www.campdenbri.co.uk/memberzone.php

Challenges of producing healthier bakery products

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For a range of functions, bakery products are dependent on ingredients which are often associated with negative health impacts. This creates a challenge for the bakery sector that is striving to produce healthier products.

In a new blog, head of baking and cereal processing Gary Tucker covers the challenges of reducing salt, fat and sugar in bakery products while increasing the level of fibre and micronutrients. Read the full article by searching 'blogs' at campdenbri.co.uk ■

Our conference, on 19-20 May 2020, will cover recent developments and challenges in the bakery sector.



More blogs

Search 'blogs' at campdenbri.co.uk

Solid-state microwaves - the future?
Danny Bayliss and Greg Hooper

Five ways Campden BRI can help you with your thermal process validation
David Whittaker

Q&A

Egg replacement challenges

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Veganism is currently a hot topic, but egg is a key ingredient in many food products that stands in its (and product development leaders) way. So, in advance of her appearance at Fi Europe next month, our ingredients research team leader Tiia Morsky responded to some questions on what the industry can use as an alternative.

1 What projects are you mainly involved with at Campden BRI?

I specialise in the properties and processes of plant protein ingredients. One of the projects I manage develops techniques to produce plant-based protein-rich ingredients efficiently.

2 What challenges are producers currently facing?

In short, it's development of vegan products. The food industry is seeking alternatives to egg ingredients, so in response we've launched a new Egg Replacement Club project to help them with this.

3 What are the main issues with trying to find replacements?

Eggs are a unique multi-functional ingredient used for aeration, emulsification, enriching, colour, shine, and structure forming. It's because of this versatility that many manufacturers depend on this ingredient, making it a real challenge to replace.

4 Could you give an egg substitute example? Why is it a good alternative?

Pulses are known to have great functional properties including foaming, emulsification and gelling due to their chemical composition. Our recent research work found pulses - such as peas, beans and lentils - displaying significantly higher foam expansion and foam volume stability compared to egg white proteins. ■

Tiia will be discussing plant-based clean label alternatives at Fi Europe's conference in Paris (see page 3). Turn to the front page to find out more about her new member-funded project.

Training and events

A full list of scheduled courses is available on our website www.campdenbri.co.uk/training.php or you can contact us to request a brochure or discuss tailored training options: training@campdenbri.co.uk +44(0)1386 842104

Courses for 2020 now available to book online

Seminars

Safety and quality culture excellence seminar 3 December 2019

www.campdenbri.co.uk/culture-excellence-seminar.php

This seminar will provide an update on developments in food safety, quality, and health and safety culture. Delegates will learn how to overcome the challenges they face when improving their company's culture with the opportunity to ask experts questions and share experiences. This is free for members of the Culture Excellence Programme, but also open to other companies.

Food labelling update

5 December 2019

www.campdenbri.co.uk/food-labelling-seminar.php

This seminar will examine the current and forthcoming labelling landscape and look at updates to key legislation and guidance. Various perspectives will be offered from industry, consumer policy and enforcement areas to enable delegates to ensure they are up to date with the latest developments that need to be considered when looking at food labels. ■



Skills and knowledge

Training

December 2019 training courses

- | | | |
|-------|---|------|
| 2-6 | FSSC 22000 auditor/lead auditor course | full |
| 2-6 | HACCP - advanced (level 4) | |
| 4-6 | Practical microbiology - intermediate | |
| 10-11 | Food and drink labelling | full |
| 10-11 | HACCP - intermediate (level 3) | |

New courses introduced

Look out for some of the new courses we've introduced. Dates for 2020 include:

- | | |
|--------|--|
| 5 Mar | Foodborne viruses: Norovirus, Hepatitis A, Hepatitis E - transmission, detection and control |
| 19 Mar | Cooking (heating) instruction development and validation: (inc. BRC 8 compliance) |
| 24 Mar | Microbiology measurement uncertainty: meeting the new requirements for ISO 19036 |
| 12 May | Food and drink labelling refresher |

www.campdenbri.co.uk/training.php